



**ILLCIT DRUG & SUBSTANCE ABUSE AMONG MILITARY 18 - 25 YEAR OLDS:**

**POLICY, PRINCIPLES, & CONTROL**

**By**

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## **DEDICATION**

This paper is dedicated to my parents, Eduardo and Ethlyn Young. They never pressured me into following their dreams, but strongly supported and encouraged my own.

Also, to my wife Mary, who pointed out this dark tunnel of a project to me and then held the light at its end so that I could find my way through it. She is and always will be my best friend.

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Thesis submitted to the MPH Committee - 21 April 1997

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School of Public Health, 1997

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This paper presents the patterns of illicit drug use (substance abuse) among military personnel 18 - 25 years of age. The extant data, current literature, and present policy are reviewed and analyzed. Previous investigations into the subject matter are discussed including theories and mechanisms which may be involved in drug prevalence among military personnel. The composite findings of those investigations and current survey data provide a detailed insight to past trends and allow a more focused comparison of substance abuse and usage between military and civilian 18 - 25 year olds. The conclusions and recommendations suggest means to combat illicit drug use, establish substance abuse awareness, and influence a focus on resource allocation for Health Promotions within the military community.

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## INTRODUCTION

Various sources note that there is a general public intolerance for substance abuse among Americans (17, 18, 19, 31). The overall supply and demand for drugs also remains ever present (26). Drug use has serious adverse effects on a significant proportion of the U.S. work force that results in billions of dollars of lost productivity each year (31). The profits from illegal drugs provide the single greatest source of income for organized crime, fuel violent street crime, and otherwise contribute to the breakdown of society (26). The Federal Government's need to maintain employee productivity for the accomplishment of Agency missions allows no tolerance for drug use in the workplace (24). In fact, the use of illegal drugs by Federal employees, on or off duty, is inconsistent not only with the law-abiding behavior expected of all citizens, but also with the special trust placed in such employees as servants of the public (24).

Because the Department of Defense's (DoD) mission is to protect and defend the United States, public confidence in the DoD is essential. The present conception is that military members represent honesty, self-worth, orderliness, discipline, self-control, and for many they are viewed as role models. Thus, it is imperative that military personnel be free from the influence of drugs and be able to work in a drug-free environment. If we allow our military personnel to abuse drugs, we compromise the public's respect for being our nation's defenders.

This report reviews civilian and military drug use trends. It will note the difference in illicit drug use between the major contributors for the U.S. military and civilians. Extant data

and U.S. military drug policy will be critically analyzed. Then a discussion of drug use theories and mechanisms that may be involved in the difference in drug prevalence among the military and civilian groups will be conducted.

## **ILLICIT DRUGS**

### **DRUGS: DEFINITION**

The meaning of the word drug varies with the context in which it is used. From a strictly scientific point of view, a drug is any substance, other than food, which by its chemical nature affects the structure or function of a living organism. From this perspective, the term includes some agricultural and industrial chemicals. A physician might define a drug as any substance used as a medicine in the treatment of physical or mental disease, when treatment of illness is the intent. The lay public may use the word in the same sense. However, when used in the context of drug "abuse" or a drug "problem," the meaning or definition of the word "drug" becomes more social rather than scientific (36).

Depending on the context in which the term "drug" is used, statements from the general population, about what a given drug does, are liable to differ. Some psychoactive substances, such as alcohol and tobacco, are infrequently, in public law or most public discussion, regarded as drugs. Alcohol is usually considered a beverage, a food, a social lubricant or a relaxant, but rarely is it called a depressant drug (36). Nicotine inhaled from cigarette smoke has been shown to affect the ganglionic sympathetic nervous system.

Alterations of electroencephalographic recordings with ganglionic paralysis occurs, which, through acute overdose, can result in death. Fortunately, such acute poisoning is uncommon with the dose that one is exposed to while smoking (8). Furthermore, for both, the public has been conditioned to regard them as something fundamentally different from marijuana cigarettes, barbiturate capsules or a bag of cocaine.

To most laypersons "street" drugs act on entirely different principles than "medical" drugs. The fact is, all drugs act according to the same general principles. All drugs have multiple effects. The lower the dose, the more important non-drug factors become in determining drug effect. This should dispel all confusion that both alcohol and nicotine are drugs. Their effects vary with dose. For each drug there is an effective dose (in terms of the desired effect), a toxic dose and a lethal dose (36).

#### ILLICIT DRUGS: DEFINITION

As the National Household Survey on Drug Abuse (NHS) results demonstrate, drug abuse may refer to any type of drug or chemical without regard to its pharmacologic actions (50). It is an eclectic concept having only one uniform connotation: societal disapproval. Both alcohol and cigarettes were regarded as substance use in the NHS and in the DoD Survey of Health Related Behaviors Among Military Personnel (DoD Survey) (14, 15, 48, 49, 50). These surveys also considered alcohol and cigarettes separate entities for analyzing trends among the general population and the military.

Illicit drug use in the DoD and NHS surveys was defined as non-medical use one or more times of marijuana or hashish, inhalants, hallucinogens -- Lysergic Acid Diethylamide/ Phenycyclidine (LSD/PCP), cocaine, heroin, stimulants, sedatives, tranquilizers, anabolic steroids, analgesics, or "designer" drugs (6, 7, 14, 15, 33, 48, 49, 50). No attempt was made to measure the quantity or size of doses due to respondent inability to furnish such details. Substance abuse is usually defined as using any drug to change mind or body functioning without a medical prescription, or for over-the-counter drug use, contrary to the manufacturer's instructions (33).

In 1970 the Drug Enforcement Administration (DEA) created a "Controlled Substances Schedule" under guidelines provided by the Controlled Substances Act. Drug categories are scheduled under Federal law according to their effects, medical use, and potential abuse. In general, illicit drug abuse comprises the unauthorized usage of natural and synthetic controlled substances included in schedule I or II (Table 1). Substances in the remaining categories, were considered "legal drugs" under a valid prescription or other use authorized by law (6, 7, 14, 15, 48, 49, 50).

**TABLE 1**

**SCHEDULE OF PSYCHOACTIVE DRUGS**

<b><u>DEA SCHEDULE</u></b>	<b><u>ABUSE POTENTIAL</u></b>	<b><u>EXAMPLES OF DRUGS</u></b>	<b><u>GENERAL EFFECTS</u></b>	<b><u>MEDICAL USE</u></b>
I	Highest	Heroin, LSD, Hashish, marijuana, methaqualone, designer drugs	Unpredictable, severe psychological or physical dependence, or death	No accepted medical use; some are legal for limited research use only
II	High	Morphine, PCP, Codeine, Cocaine, Methadone, Demerol, Benzedrine, Dexedrine	May lead to severe psychological or physical dependence	Accepted use with restrictions
III	Medium	Codeine with aspirin or tylenol, Amphetamines, Anabolic steroids	May lead to moderate or low physical dependence or high psychological dependence	Accepted use
IV	Low	Darvon, Talwin, Phenobarbital, Equanil, Miltown, Librium, Diazepam	May lead to limited physical or psychological dependence	Accepted use
V	Lowest	Over-the-counter or prescription compounds with codeine, Lomotil, Robitussin AC	May lead to limited physical or psychological dependence	Accepted use

Source: DEA 1994 - Drugs of Abuse, Physician's Desk Reference 1995



## **DRUG USE: RISK ASSESSMENT**

### **ILLCIT DRUG ACTIONS AND EFFECTS:**

Before going into detail on why risks with psychoactive drugs are taken, their effect on individuals must be noted. A key element in drug-risk behavior is the drug of choice and the outcome being sought by the individual. Along with the effect desired, there are other things involved with drug-related risk which are important in describing risk behavior.

Noting that not all psychoactive drugs act the same way, the following variables mentioned by the National Commission on Marijuana and Drug Abuse (NCMDA) should be considered.

Drug-related risk varies:

1. With the mode or route of drug administration, usually highest for intravenous administration and lowest for oral ingestion.
2. According to the setting in which use occurs, particularly when low doses are used.
3. According to the user's capacity to control intake and detoxify the drug. The greatest risk occurs when the rate of administration exceeds the capacity of the body to detoxify the drug and consequently the brain is never drug free.
4. According to the "set" of the user, including the expected and desired outcome of the drug experience, the user's personality, his/her ability to compensate for drug effects on the basis of prior experience, and his/her ability to limit intake according to a predetermined capacity.
5. Often increases significantly if more than one drug is used concomitantly.

Many risks associated with drug use are a function of social policy rather than of the drugs themselves. Unintentional drug overdoses, whatever their precise pharmacological characteristics, occur most often among those who have secured drugs outside the legitimate channels which control quality, quantity, and potency (36).

The variability and unsupervised use of illicit substances, especially if they are taken intravenously, can increase the likelihood of other disorders and diseases (8, 35). Problems frequently result from chronic use and are likely to occur through use of unsterilized equipment, injection of insoluble material, or administration of an "un-cut" dose (36). Clinically, other factors for "intended" drug effects depend upon the dose, its bioavailability in plasma, the concomitant presence of other drugs, or preexisting medical problems (51). General negative effects on body systems for all of the illicit drugs, as listed in table 2, include one, several, or all of the following: acute changes in the gastrointestinal system; direct effects on receptors in the central nervous system; acute changes in the respiratory system; and cardiovascular system changes (35, 51, 57).

**TABLE 2****SOME EFFECTS OF ILLEGAL (ILLICIT) DRUGS**

<b><u>DRUG TYPE</u></b>	<b><u>DESIRED SHORT TERM EFFECTS</u></b>	<b><u>OTHER EFFECTS</u></b>	<b><u>DURATION OF ACUTE EFFECTS</u></b>	<b><u>DEA VIEW ON RISK OF DEPENDENCE</u></b>
Heroin	Euphoria, Pain reduction	Respiratory depression, Nausea, Drowsiness	3 to 6 hrs	Physical = high Psychological = high
Cocaine	Excitement, Euphoria, Increased alertness, Wakefulness	Increased BP & respiratory rate, Nausea, Cold sweats, Headaches	1 to 2 hrs	Physical = possible Psychological = high
Crack cocaine	Same as cocaine, - a more rapid high	Same as cocaine	about 5 minutes	Same as cocaine
Marijuana	Euphoria, Relaxation	Tachycardia, Impairment of perception, judgment, fine motor skills, & memory	2 to 4 hrs	Physical = unknown Psychological = high
Amphetamines	Euphoria, Excitement, Increased alertness, Wakefulness	Increased BP & pulse rate, Insomnia, Loss of appetite	2 to 4 hrs	Physical = possible Psychological = high
LSD	Illusions and hallucinations, Excitement, Euphoria	Poor time & distance perception, Acute anxiety, Restlessness, Sleeplessness, Depression	8 to 12 hrs	Physical = none Psychological = Unknown

Source: DEA 1994, Gadol 1992, NIDA 1996

Impairments to body systems from the use of illicit drugs are extensively documented (4, 5, 6, 10, 14, 15, 17, 21, 31, 56, 57). Table 3 lists several of the detrimental problems or negative consequences associated with illicit drug use.

**TABLE 3**

**DOCUMENTED NEGATIVE AND DETRIMENTAL EFFECTS OF ILLICIT SUBSTANCES**

UNCONTROLLABLE DEPENDENCE (ADDICTION)	LEGAL AND FINANCIAL PROBLEMS
MAJOR ACCIDENTS (AUTO, OCCUPATIONAL)	DISRUPTION OF THE FAMILY STRUCTURE (ABUSE - VIOLENCE)
CONFLICTS IN THE WORKPLACE ENVIRONMENT	A REDUCTION IN READINESS *
NUMEROUS MEDICAL COMPLICATIONS (INJURIES, DISABILITIES, ORGAN DAMAGE OR IMPAIRMENT)	DIMINISHED REFLEXES, LOSS OF CONCENTRATION (IMPAIRED PSYCHOMOTOR CAPACITY)
SOCIAL (PSYCHO) DIFFICULTIES (PARANOIA, DEPRESSION)	HALLUCINATIONS AND FLASHBACKS
INFERTILITY, MENSTRUAL IRREGULARITIES	SUICIDE AND DEATH

\* Military Readiness

Source: Anonymous 1990, 92, 93, Bray 1992, 95, Burns 1996, Boorda 1996, Dalton 1996, Hollister 1985, IHP 1993, US DHHS 1995.

## RISK ATTITUDES, INFLUENCES, AND PERCEPTIONS:

To understand the rationale behind drug use, one must first understand the different types of drug-using behavior. These behavioral classifications are key to deciphering the meaning of drug use for an individual. They are also an important part to the rationale behind the U.S. national policy on drug use.

The most common type of drug-using behavior can be classified as experimental: a short-term, non-patterned trial of one or more drugs, motivated primarily by curiosity ("To see what it is like") or a desire to experience an altered mood state (6, 7, 36). Experimental use most often occurs among young persons in the company of one or more drug-experimenting friends or acquaintances ("To feel like part of the crowd") (6, 7, 36).

The next most common type of drug-using behavior is non-experimental use. It can be classified as recreational use that usually occurs in social settings among friends or associates who desire to share an experience that they define as both acceptable and pleasurable. Generally, recreational use is voluntary and tends not to escalate to more frequent or intense use patterns. This type of behavior is not sustained by virtue of the dependence of the user on the drug in any meaningful sense of that term (36).

Another pattern of drug-using behavior is circumstantial drug use. This behavior is generally motivated by the user's perceived need or desire to achieve a new and anticipated effect to cope with a specific problem, situation or condition of a personal or vocational nature ("To escape emotional problems or the feeling of loneliness"; "To get me going"). This

classification would include students who utilize stimulants during preparation for exams, long-distance truckers who rely on similar substances to provide extended endurance and alertness, military personnel who use drugs to cope with the stress of combat situations, athletes who attempt to improve their performance and homemakers who seek to relieve tension, anxiety, boredom or other stresses through the use of sedatives or stimulants (6, 7, 36). One must not forget the influence of adults and role models who use drugs or have others mimicking or imitating them!

Unfortunately, there is also a peripheral group of individuals who have escalated from recreational use to patterns of intensified drug-using behavior. Motivation for chronic use or dependence falls into an amorphous category. The NCMDA refers to this as drug use which occurs at least daily and is motivated by an individual's perceived need to achieve relief from a persistent problem or stressful situation, or his/her desire to maintain a certain self-prescribed level of performance. This category includes persons generally referred to as "problem drinkers" or "heavy social drinkers," homemakers who regularly consume barbiturates or other sedatives, and business executives who regularly consume tranquilizers (36). The propensity to turn to drugs as sources of excitement or meaning in an unsatisfying existence is high. Disturbingly, this pattern of drug-using behavior has an increased likelihood or disposition towards compulsion. Compulsion consists of a patterned behavior of a high frequency and high level of intensity, characterized by a high degree of psychological dependence and perhaps physical dependence as well (6, 7, 36).

In Paul Slovic's article on "Surveying the Risk Assessment Battlefield", he mentions risk assessment as being inherently subjective (47). The decision to use drugs seems to be based on an individual's judgment of his/her exposure to the hazards involved with illicit drug use. This represents a blending of science, cultural, and political factors (47). Most people (especially those not involved with the health sciences) are not accustomed to thinking about drug effects in terms of probabilities and uncertainties, of dose-response curves, of multiple effects (some desirable and some undesirable), or of reactions which are based on individual variability. Medical approval or sanctioning of drug use (as in the case of prescription or over-the-counter drugs) is not always considered as distinct from a situation where an individual chooses to use a drug him/herself. One cannot exclude that an individual's motivation for utilization of a drug may entail a personal, medically-intended purpose. Neither can one always ensure that the drug will be used for its intended purposes (36).

Therefore, the misuse of drugs creates an impression that all drug-using behavior falls into one of two categories; drug use which is good, safe, beneficial, and without social consequence; and drug/substance "abuse" that is bad, harmful, without benefit and carrying high social cost. The former usually describes the realm of drug use sanctioned by medical judgment. The latter becomes a problem when an individual chooses to use any drug in the absence of medical intervention. The primary determinants of these decisions are the perceived harm or risk and social disapproval. Risks to individual health are usually tolerated only if the medical needs for the substance justify the risks (36, 47). From either a descriptive or an evaluative standpoint, the matter is very complex.

## **THE NATIONAL HOUSEHOLD AND DEPARTMENT OF DEFENSE SURVEYS**

There are two important studies that provide valuable statistics on illicit drug use among two large groups within our population: the civilian workforce and the military services. These studies are the National Household and Department of Defense Surveys on Drug Abuse. The results from these surveys also help form the basis of U.S. civilian and military policy on drug use.

### **THE NATIONAL HOUSEHOLD SURVEY**

The National Household Survey on Drug Abuse (NHSDA) is the primary source of statistical information on the illegal use of drugs by the United States civilian population. It has been conducted yearly by the federal government since 1971. Data is collected by administering questionnaires to a representative sample of the U.S. population (age 12 and older) at their place of residence (48, 49, 50). This Survey is presently sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA). The survey provides estimates of the prevalence of illegal drugs (among other substances) used in the U.S., and monitors time trends of prevalence (48, 49, 50).

The civilian group studied are residents of households, non-institutional group quarters (for example, shelters, rooming houses, dormitories), and civilians living on military bases.

Persons excluded from the study population include the homeless who never used shelters, active military personnel, and residents of institutional group quarters, such as jails and hospitals (48, 50).



## THE DEPARTMENT OF DEFENSE SURVEY

The Department of Defense Survey of Health Related Behaviors Among Military Personnel (DoD Survey) was the primary source of statistical information on the illegal use of drugs by the U. S. military population. It was administered through the Research Triangle Institute (RTI) under the sponsorship of the Office of the Assistant Secretary of Defense (Health Affairs) in 1982 (15). This survey was started in 1980 and was conducted by Burt Associates, Inc. of Bethesda, Maryland (15). The DoD Survey provides the most comprehensive and detailed estimates of the prevalence of alcohol, illicit drug, and tobacco use in addition to other health and behavioral aspects for this particular community (15).

The military group included U.S. based military personnel on active duty during survey administration. Excluded were basic trainees, Service Academy cadets and midshipmen (all lacked military experience), personnel undergoing a permanent change of station (PCS), and personnel absent without official leave (AWOL) (14, 15).

## OTHER SURVEYS

A few other surveys gathered comprehensive and significant information pertaining to the prevalence of illicit drug use among the study population. The 1996 Monitoring the Future: A Continuing Study of the Lifestyles and Values of Youth Survey was one of them (38). Its main focus was on drug abuse and related attitudes of America's adolescents. The study is sometimes referred to as the "High School Senior Survey", because each year a sample of students (8th - 12th grade) in public and private schools is surveyed. This annual

series began in 1975. The survey was conducted by the University of Michigan's Institute for Social Research and was funded by the National Institute on Drug Abuse (38). Each year about 2,400 members of previous participating graduating classes are surveyed by mail. An annual national sample of college students (numbering about 1,400) takes part in the follow-up studies (38). Thus, the study population included civilians 18 - 25 years of age. In the survey, college students were defined as high school graduates 1 to 4 years past high school enrolled full time in a 2-year or 4-year college or university.

Another study that requires equitable mention was the 1971 DoD Survey of Drug Use performed by the U.S. Army Human Resources Research Organization (HumRRO). Little reference or citation was found in the literature to it. It was, in fact, the pilot program conducted by the DoD to estimate the magnitude of the drug abuse problem in the Armed Forces (27). This study was designed to estimate the use of non-therapeutic drugs in the military, to devise the nucleus of our present day drug education, rehabilitation, detection and policies for both military and civilian populations (27). Although information was gathered from all four services, its stratified results focused mainly on Army projections since that community was determined to show a consistently higher prevalence of drug use among its members (27). The results from this survey provided a valuable insight on the history of military drug abuse.

## COMPARISON OF SURVEYS' ISSUES

Both the NHSDA and DoD Surveys of 1995 provided detailed (stratified) cross-sectional data on substance abuse and noted secular trends for their relative populations. Although some references were made to the general civilian population from the earlier versions of the DoD survey, those reports did not emphasize or detail many analogies between civilian and military groups. One study, conducted by Bray, et. al. in 1991, compared results from the 1985 DoD and NHS surveys. They noted the difficulties in making adequate comparisons between the two surveys (12). Since 1992, the DoD has focused its questions regarding illicit drug and substance abuse on the same basis used by the NHSDA. This was done to allow for more accurate comparisons between the military community and the civilian population (15). Because the DoD Survey was not conducted on an annual basis or concurrently with NHS, comparative analysis of data has recently consisted of the DoD using the NHSDA statistics from the preceding year. This may weaken inferences on the differences observed between the two groups. A stronger comparison between the two surveys could be made if data were acquired during the same year for military vs. civilians. This would allow for an easier adjustment and correlation analysis of factors that Bray, et. al. recognized as study limitations (11, 12). Their problems dealt with items such as, current effectiveness of education, shifts in policies, prevention programs, changes in the level of commitment to use, changes in the sociodemographic characteristics of the military, and trends of use in our U.S. civilian population.

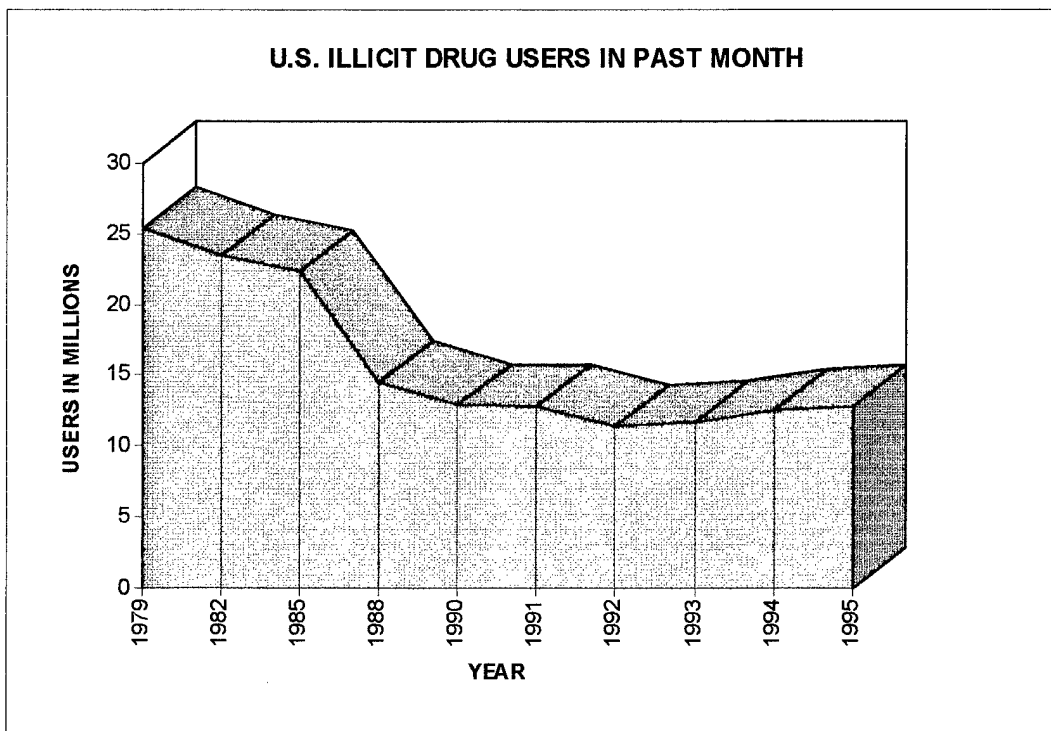
## CIVILIAN AND MILITARY

### SECULAR TRENDS IN SUBSTANCE AND ILLICIT DRUG USE

The 1992 National Household Survey data revealed that the number of illicit drug users in the US had not changed significantly since 1989. Figure 1 shows that the numbers of illicit drug users in 1994 and 1995 resumed an upward trend to 12.6 and 12.8 million respectively (48, 49, 50). This increase followed more than a decade of substance abuse decline from the peak year of 1979.

**FIGURE 1**

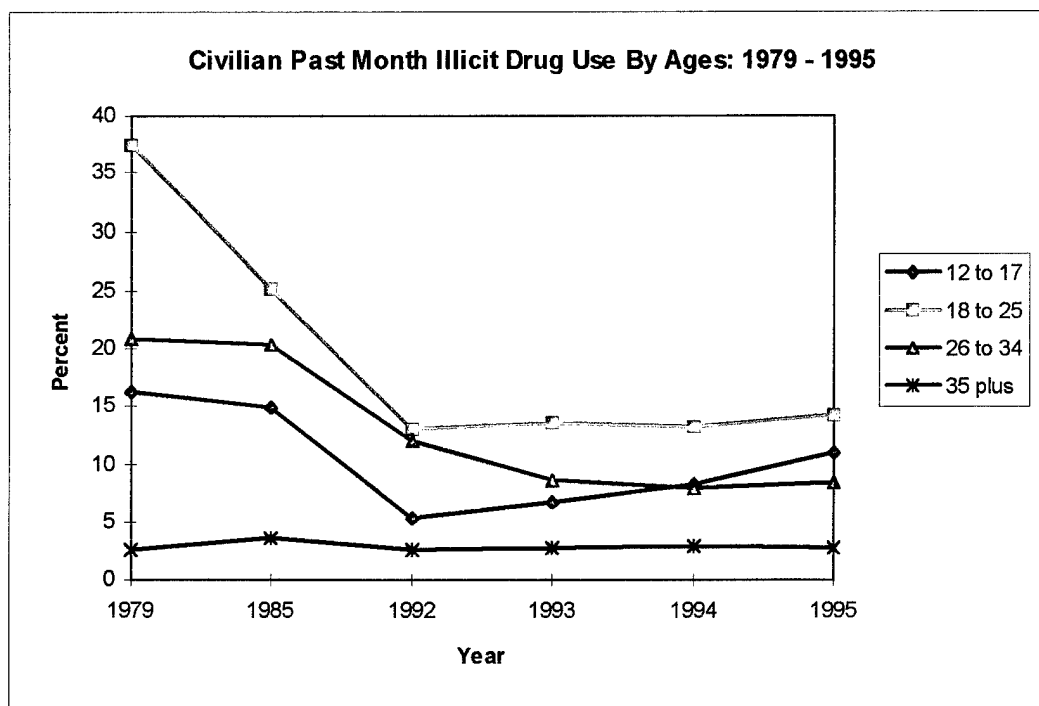
#### **CIVILIAN TREND OF ILLICIT DRUG USE WITHIN THE LAST 30 DAYS**



Source: National Household Survey on Drug Abuse 1979-1995, (SAMHSA 1993-95)

The 1995 national survey report revealed that current 'within last month' illicit drug use rates were the highest among ages 18-25 (14.2%) (48, 50). This was a statistically significant increase from the 1993 and 1994 values of 13.2 and 13.5% (48, 49, 50).

**FIGURE 2**  
**CIVILIAN TRENDS IN PREVALENCE OF ILLICIT DRUG**  
**USE AMONG AGE GROUPS**

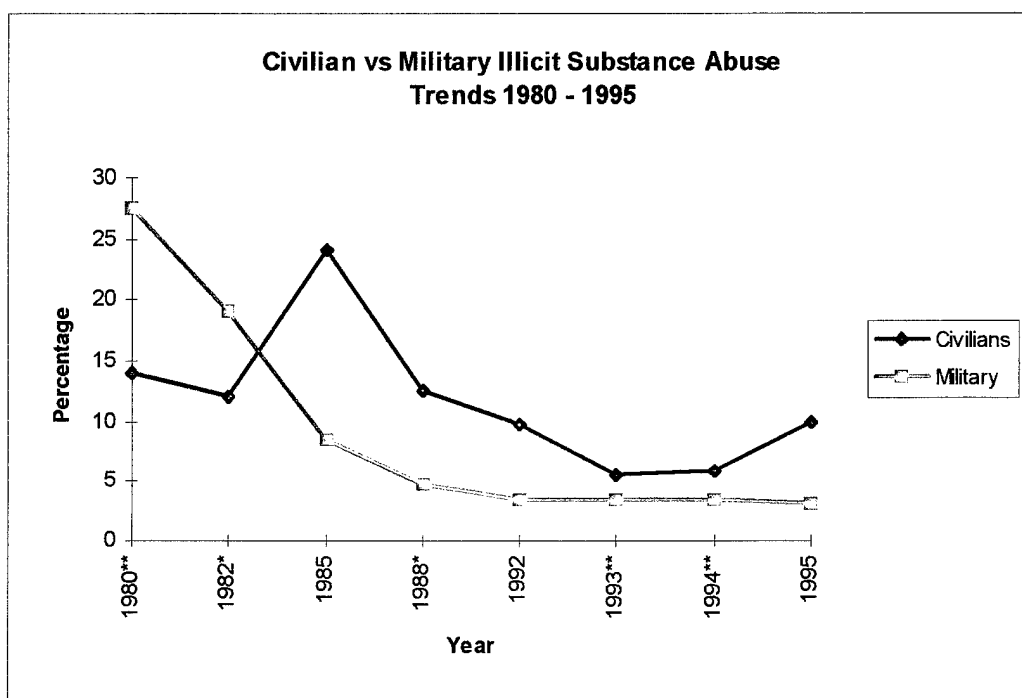


Source: National Household Survey on Drug Abuse 1979-1995, (SAMHSA 1993-95)

Since 1980, the military sector has also shown an overall decrease in illicit drug use. From 1982 to 1992 illicit drug use decreased 88% (14, 15, 18, 26). When demographic differences are taken into account, drug use rates after 1982 have been consistently lower among military personnel than among civilians as a whole (15, 53) (Figure 3).

**FIGURE 3**

**CIVILIAN AND MILITARY TRENDS OF ILLICIT DRUG USE: 1980 - 1995**

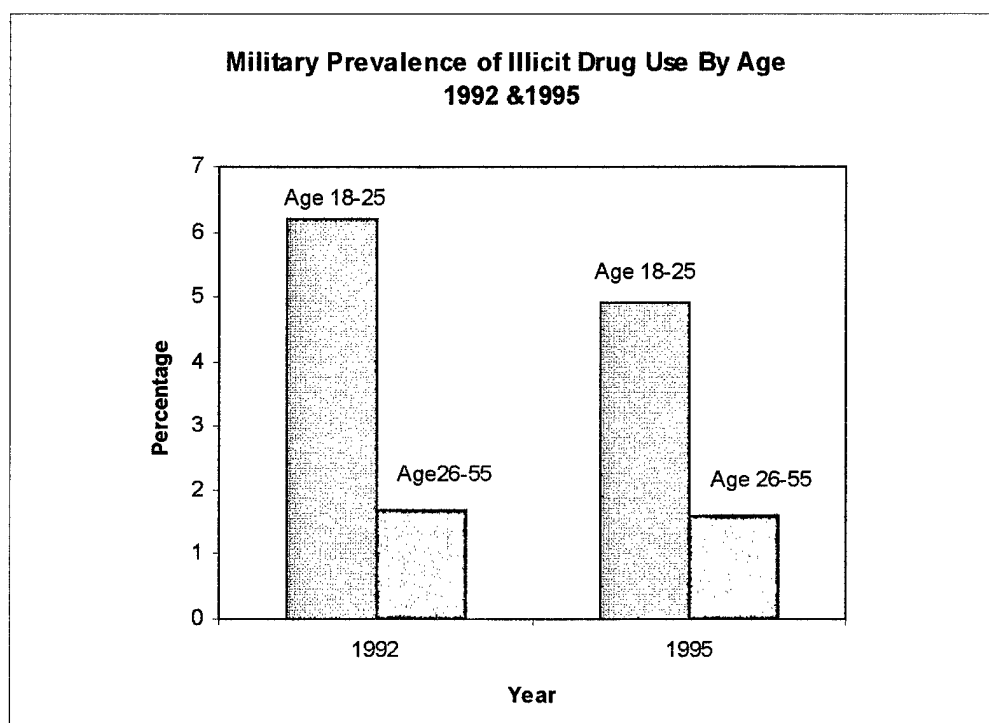


\* Estimates for civilian's percentages are based on millions of users and U.S. census population extrapolations.

\*\* Non-standardized rates for 1980, 93, & 94 are based on same year standardized data from NHS and DoD surveys Source: Bray 1992, 95, SAMHSA 1979-1995, U.S. Census 97

Among military personnel, DoD studies have consistently shown that the main population at risk was the younger enlisted personnel between 18-25 years of age (Figure 4) (3, 14, 15, 40, 41).

**FIGURE 4**  
**MILITARY PREVALENCE OF ILLICIT DRUG**  
**USE AMONG AGE GROUPS: 1992 & 1995**



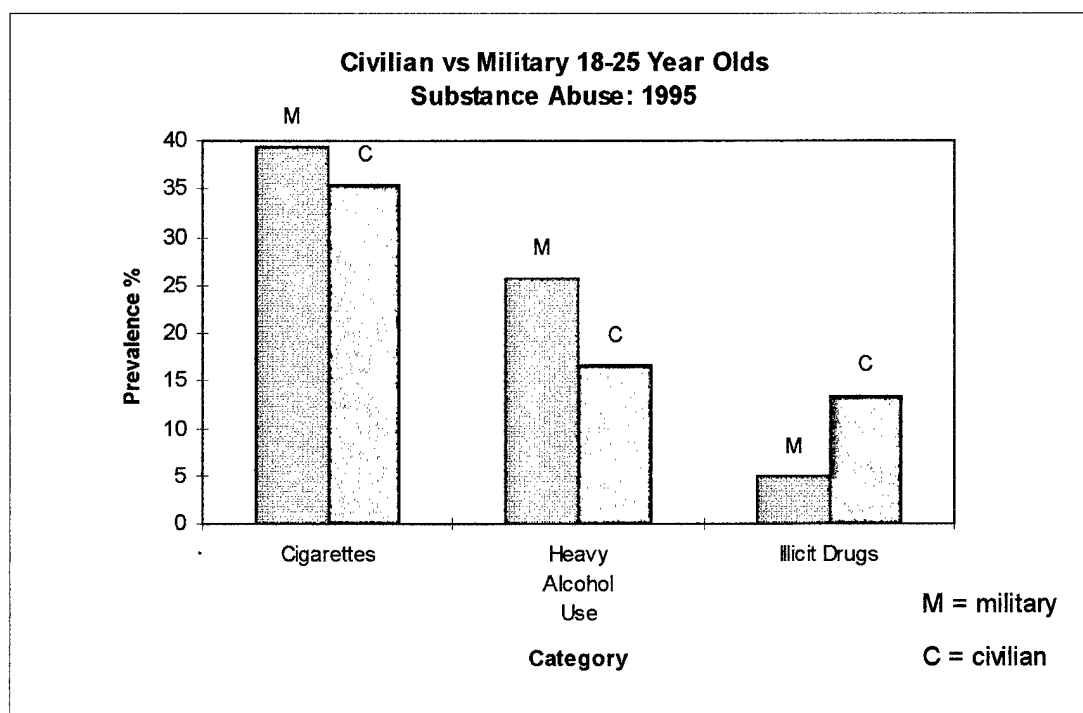
Source: Bray 1992 & 1995

## WHERE THE SCALE TILTS: WHO'S INVOLVED?

The young adult civilian population is the recognized source of new military personnel. High school graduate recruits, ages 17-21, and college educated individuals, ages 21-25, both fall into the high risk category. Acknowledging that a significant gender difference exists between the military and civilian populations, one would expect illicit drug use to have a closer relationship as seen with alcohol and cigarette use for both groups (Figure 5).

**FIGURE 5**

### **CIVILIAN AND MILITARY 18 - 25 YEAR OLDS SUBSTANCE USE**

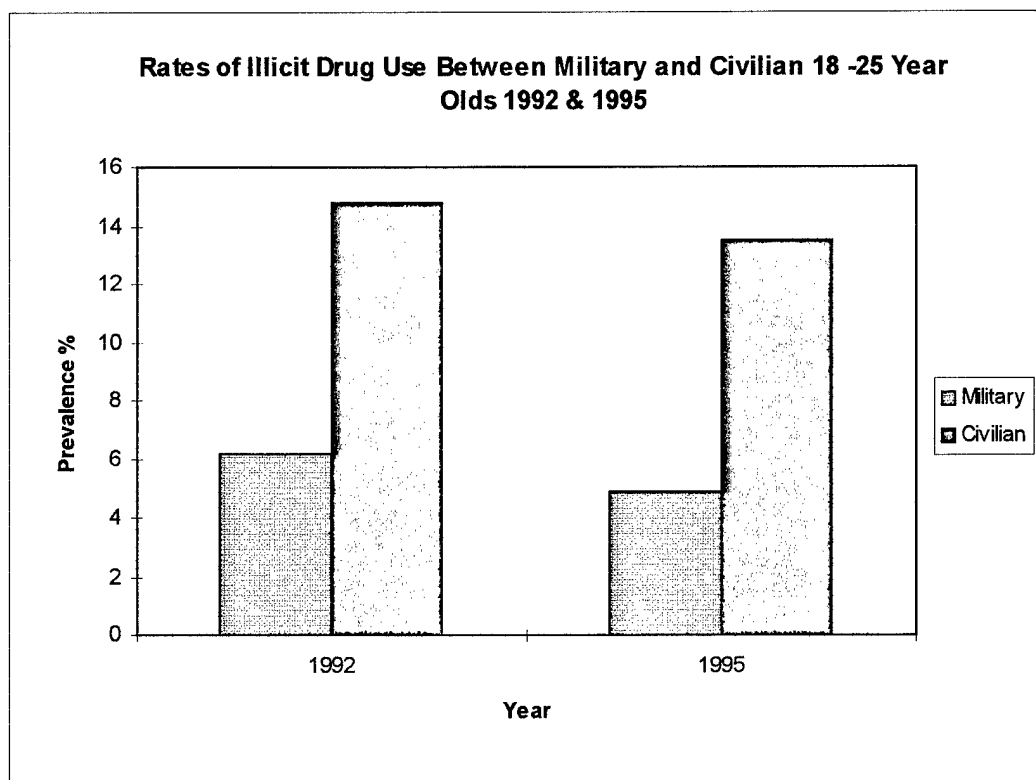


Source: Bray 1995, NHS 1994



Eighty-five percent of the U. S. military was male in 1992. In 1993 and 1995 it was 88.4 and 87.4% respectively (15, 52). Stratified data from both civilian and military studies showed that overall substance use (including alcohol and cigarettes) varied by age group and was more common among men than women (14, 15, 48, 49, 50). However, with gender adjustments, military 18 - 25 year olds still used illicit drugs far less than their civilian counterparts (Figure 6).

**FIGURE 6**  
**RATES OF ILLICIT DRUG USE BETWEEN**  
**MILITARY AND CIVILIAN 18 - 25 YEAR OLDS: 1992 & 1995**



Source: 1992 and 1995 DoD Survey, 1991 and 1994 NHS, SAMHSA 1996.

## COMPARISON OF THE MAIN CONTRIBUTORS

For comparing the main contributors of illicit drug use for the civilian and military populations, the relative risk (Odds Ratio) was calculated using 1995 NHS and DoD survey data. The odds ratio only estimates the relative risk, an epidemiologic measure of association, when comparing frequency of an exposure. Since it is not possible with prevalence studies to determine if the exposure to a risk or hazard preceded or followed the onset from a disease status, the odds ratio for rare disease is assumed to approximate the relative risk.

The independent variables used for the comparison were 18-25 yr. old civilians and 18-25 yr. old military personnel. For the purposes of this calculation, being in the military notes the “exposure” to some type of mechanism that deters or decreases drug use prevalence. The dependent variable used was illicit drug abuse and/or usage.

**TABLE 4**

### **ESTIMATE OF RELATIVE RISK BY DRUG ABUSE PREVALENCE**

<u>18 - 25 YEAR OLDS</u>	<u>+ DRUG USE %</u>	<u>- DRUG USE %</u>
<u>CIVILIAN (“NO “EXPOSURE”)*</u>	14	86
<u>MILITARY SERVICE “EXPOSURE”*</u>	5	95

Chi Square = 4.711

Degrees of Freedom = 1,  $P < .03$

Relative Risk (ODDS) = .357 for being in the military or a 2.8 times more likelihood for civilians

\* Being in the military notes the “exposure” to some type of protective mechanism from illicit drug use.

After estimating a relative risk, the Schlesselman technique was used to see if both surveys provided adequate sample sizes to assure the statistical significance in comparison of the differences between the two specific young adult groups (Table 5) (Schlesselman 74).

**TABLE 5**  
**SCHLESSELMAN CALCULATION OF SAMPLE SIZE**

$$\alpha = .05$$

$$\beta = .1 \text{ for } 90\% \text{ power: } Z\beta = 1.28$$

Lower prevalence group  $P_1 = .05$

Higher prevalence group  $P_2 = .14$

$$\bar{p} = (P_1 + P_2)/2 \Rightarrow \bar{p} = .095$$

$$\bar{q} = (1 - \bar{p}) = .905$$

$$N = \{1.96\sqrt{2(.095)(.905)} + 1.28 \sqrt{.05[3.8 - .05(1 + 7.84)]}\}^2 / [.05(1 - 2.8)]^2$$

$N \cong 221$  individuals required in each survey: Adjusting for an estimated 80% usable rate implies that  $\cong 265$  individuals will suffice in showing that a statistically significant difference between the groups exists.

#### **SIGNIFICANCE OF THE COMPARISONS BETWEEN MILITARY AND CIVILIAN 18 TO 25 YEAR OLDS**

The 1995 NHS and DoD surveys had adequate sample sizes for comparing their 18 - 25 year old groups. Therefore, a statistically significant difference in prevalence of illicit substance use for military and civilian young adults was noted. Population estimates for 1995

note that the number of civilian 18 - 25 year olds was around 28 million (48, 50, 52, 53). Of this group, illicit drug users comprised 14.2% or 3.9 million individuals. For the NHS, around 4000 young civilians made up the study group (48, 50). Thus, the NHS sample encompassed about 0.014 % of the total U.S. 18 - 25 year old civilian community. Conversely, military 18 - 25 year olds made up around 42% of the total DoD force (approximately 650,000 individuals) (2, 23). The 4.9% prevalence seen (or about 31,850 individuals) in the military 18 - 25 year olds was noted using about 4300 young military adults (over 26 % of 1995's surveyed DoD population) (15). Therefore, that sample comprised about 0.66% of the U. S. military 18 - 25 year olds.

Sampling errors in these surveys may be present since only a portion of the populations (civilian and military) is observed. Also, surveys have the potential to underestimate results because of individual biases in taking them. The DoD survey data though had a higher degree of accuracy for its population since its sampling percentage was over 37 times greater than that of the National Household Survey.

Because military personnel are drawn from the civilian population, one expects to see the prevalence and use level of illicit drugs to be similar. However, it was noted that military 18 - 25 year olds seem to have a substantially lower prevalence of illicit drug use. It is still unknown with certainty what specifically accounts for this difference.

It has been argued that distinctive military conditions such as relocation overseas, greater perceived need for acceptance, and separation from family could become causal

factors for drug abuse (12). The DoD surveys included individuals who were sent thousands of miles away from their only known social support structure. Even though it is difficult to control behaviors in a myriad of cultural settings, and different local laws may shape views and attitudes, increased risk-taking behavior for illicit drug use **was not** noticed in individuals stationed remote or overseas (15). In 1995, military personnel outside the confinement of the U.S. (OCONUS) had an adjusted odds ratio of 0.57 when compared with CONUS personnel drug use (15). Thus, environmental stress secondary to constant changes in location or an OCONUS assignment did not independently lead to psychological and lifestyle influences that promoted illicit drug use within the military as a whole.

The disproportionate proportion of males in the military should sway the differences in favor of the civilians. It is noted that even when rates are not adjusted for sex, higher levels of drug use was not associated with military personnel as a group (12). Hence, with the increasing percentage of women in the military, the whole prevalence for drug use should decrease even more for the military (15).

Direct comparisons of drug use prevalence can be somewhat misleading in surveys. Even with that knowledge, trends from the DoD and NHSDA revealed that there was an unusual difference between the 18 - 25 year old young adults. That difference provides an opportunity to look into what could be a reason. One precise factor accounting for the differences in substance use between the U.S.'s young military and civilian adults cannot be determined. However, an affiliation of those differences due to a cumulative effect of military life, policies, and programs directed toward substance use can be assumed.

## MILITARY PERSONNEL AND DRUGS

### HISTORY

Determining causation on why drug use may occur among military personnel requires an examination of military drug use history. It gives even more insight on the rationale behind DoD policy.

Substance abuse among members/personnel of the "modern" U.S. military (the Army, Navy, Marines, and Air Force) has been observed and actively tracked since the Vietnam era (13, 27). Drug abuse in the military had been considered primarily a disciplinary problem (22). Throughout 1970 and early into 1971 there was an increasing awareness in the U.S. that the drug abuse "fad" of the late 60's had become an enduring problem (39). Up through that time, official reliance was placed on the health professions to police the distribution of narcotics such as morphine and other opium alkaloids. Pharmaceutical regulation was relied on to control "dangerous drugs" which were labeled as non-narcotic drugs, such as hallucinogens, amphetamines and barbiturates (39). The marijuana use that increased throughout the 1960's and 1970's had public opinions caught in a highly emotional debate. Interesting situations developed with its regulation during that time. This may have led to reasons why the drug issue became even more important. The thought of classifying marijuana as a "narcotic" immediately provoked an erosion of the established profile that had previously characterized drug policy. Similarly, the inevitable comparison between alcohol and marijuana called into

question the substantive separation made between narcotics and dangerous drug policies on the one hand and alcohol (a psychoactive drug) policy on the other. Less stringent regulation of alcohol distribution (with only periodic regional attempts to prohibit its use altogether), and minimal localized restrictions on tobacco smoking in various states, intensified the debate (36). The need to distinguish marijuana use from other forms of "drug abuse" resulted in the following distinction; Marijuana was classified as a "soft" drug as opposed to the "hard" drugs (like heroin), suggesting that a similar kind of distinction could be drawn between "hard liquor" and other alcoholic beverages like beer (36). This distinction was also to be based on statistics that focused on the habit-forming characteristics of heroin and narcotics whose non-medical use was socially disapproved.

Marijuana-endorsing issues, like the Panama Canal Zone Military Investigation of 1916-1929, may have lingered in public memory. This investigation focused on the smoking of marijuana among American soldiers stationed in the Zone. A panel of civilian and military 'experts' recommended that "no steps be taken by the Canal Zone authorities to prevent the sale or use of marijuana. The conclusion that "there is no evidence that marijuana as grown and used [in the Canal Zone] is a 'habit-forming' drug" was made (43). Another report that stirred up interest was the LaGuardia Committee Report of 1944. This study was viewed by many experts as the best study of the time because of its social, medical, and legal context. The committee covered thousands of years of the history of marijuana, moreover, made a detailed examination of conditions in New York City. Among its conclusions: "The practice of

smoking marijuana does not lead to addiction in the medical sense of the word. "And: "The use of marijuana does not lead to morphine or heroin or cocaine addiction, and no effort is made to create a market for those narcotics by stimulating the practice of marijuana smoking." Finally: "The publicity concerning the catastrophic effects of marijuana smoking in New York City is unfounded" (42).

In 1961 the Joint Committee of the American Bar Association and the American Medical Association on Narcotic Drugs conducted a major combined study on drug policy. This report observed, "Drug addiction is primarily a problem for the physician rather than the policeman, and it should not be necessary for anyone to violate the criminal law solely because he is addicted to drugs." The report concluded that drug addiction was a disease, not a crime, that harsh criminal penalties were destructive, that drug prohibition ought to be reexamined, and that experiments should be conducted with British-style maintenance clinics for narcotic addicts (32).

Drug use in the 1960's was an emerging situation with children of the middle and upper classes. Drug use was associated with unfamiliar life styles, youthful defiance of the established order, the emergence of a visible street culture, campus unrest, communal living, protest politics and even political radicalism. The drug taking of this youth population coincided with pervasive social anxieties regarding social disorder in general and youthful behavior specifically (36). The DoD survey of 1971 interpreted that use of drugs in Service was highly and positively related to use of drugs as a civilian (27). Drug acquisition and use



during the Vietnam era hit the Army's enlisted population hard. Many members were vulnerable to the lure of escape and perceived pleasure promised by mind-altering drugs. The added pressures of a wartime environment in Southeast Asia virtually assured a problem of major proportions (39).

Because of the official recognition of the magnitude of the problem, President Nixon in 1971 proclaimed drug abuse as this country's "public enemy number one." Inaugural programs conducted under the Department of the Army were recognized as a means to carry interest to the civilian community for cooperative anti-drug activities (22, 39) The urine testing program, initiated in 1971, was used to detect users of opiates, amphetamines, and barbiturates (22). At that time there were no means of detecting hallucinogens and cannabis (22). The initial "Examination and Entrance Station" of the military only performed a 'historical' drug screening. Thus, "physically qualified" drug users were denied entrance into a service only if they gave a history or if they came up positive from the limited detection screening mechanisms after entrance (22).

Military, as well as civilian, attitudes toward marijuana use during that time were not swayed by statements made by the National Commission on Marijuana and Drug Abuse. In 1973 this Commission cited the following statements and only recommended research, experimentation, and humane compromise (36).

1. Possession of marijuana for personal use would no longer be an offense, but marijuana possessed in public would remain contraband subject to summary seizure and forfeiture.

2. Casual distribution of small amounts of marijuana for no remuneration, or insignificant remuneration not involving profit, would no longer be an offense.

This report may have influenced the military population's attitude towards drug use. What this probably meant to the young military person was that it was all right to continue using the "soft drugs" as long as use did not compromise one's performance and duties. If not considered addicted, punitive measures to the service personnel resulted in nothing worse than detoxification, treatment, and rehabilitation (22). This "exemption policy" protected the military individual, who identified him/her self as an abuser and potentially made it possible for even those with positive urine tests, but without disciplinary problems, to remain in service (22).

Overall, the "narcotic problem" seemed to take precedence over marijuana in the evaluation of early drug abuse program. For narcotic use, a "problem" was based on whether medical treatment was required after social evaluation. Then, review decisions were based on commander's opinions of the individual's performance of duties (22).

In 1988, Congress authorized the "Military Entrance Processing Station" (MEPS) drug testing program as a means to prevent acquisition of people who use drugs (45, 54). This was actually a revision of the older screening program but included pre-entrance drug screening measures to detect marijuana, cocaine, and blood alcohol. Until that time, little information had been provided on the effectiveness of the available drug screening measures (45). Interestingly enough, a significant change in the prevalence pattern of drug abuse

between the military and civilian populations occurred between 1982 and 1985 (Figure 3).

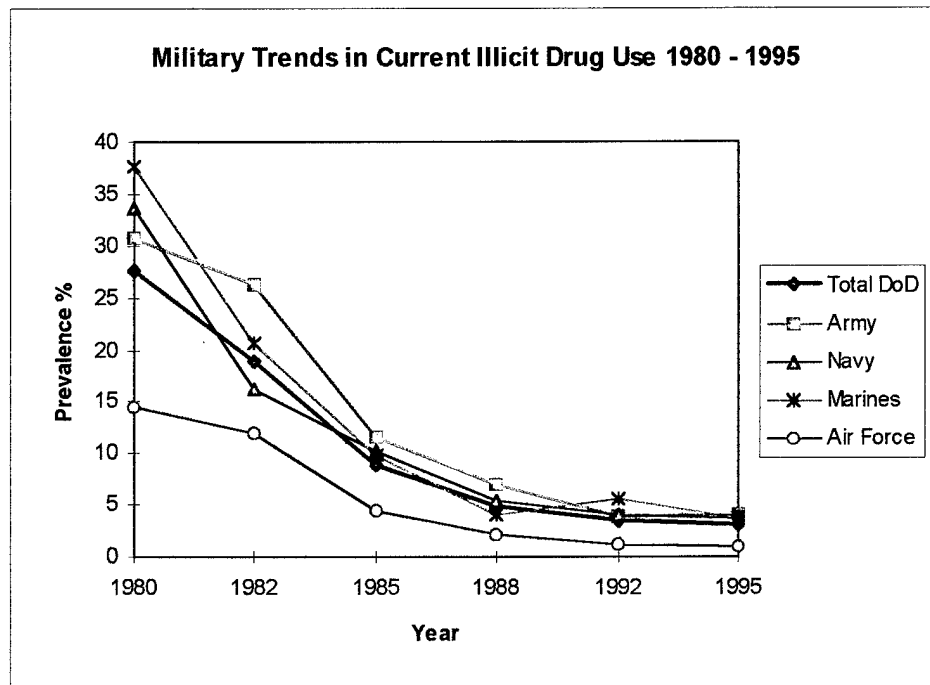
Age-standardized estimates in 1985 for both groups revealed civilian and military rates to be around 24.1% and 8.4% respectively (12).

Even though National Drug Policy changes are directed toward all U.S. citizens, survey trends give an impression that they have had a larger impact on military than civilian drug use prevalence. Along with Figure 3, Figure 7 suggests evidence that military illicit drug use declined with the following historical events:

1. The "War on Drugs" Policy by President Nixon which went into effect in 1973.
2. The National Organization for the Reformation of Marijuana which occurred in 1977.
3. The Crime Control Act, which increased Federal penalties for drug offenses in 1984 -- developed by President Reagan as the 1984 National Strategy for Prevention of Drug Abuse and Drug Trafficking (22, 31, 34).

**FIGURE 7**

**MILITARY TRENDS IN CURRENT ILLICIT DRUG USE, BY SERVICE: 1980 - 1995**



Source: Bray 1995

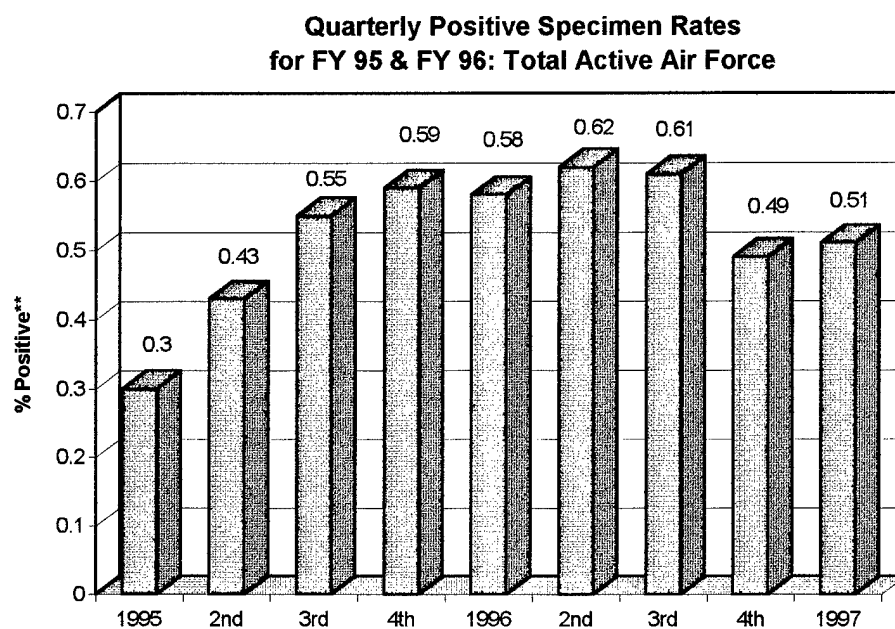
Since 1988, a leveling off of drug use prevalence occurred for the military (12). Events such as President Bush's speech on drugs in 1989, and President Clinton's "National Drug Control Strategy" messages in 1995 and 1996 did not seem to have as much of an impact on decreasing military drug prevalence or use. This was predicted by Bray, et. al. in 1991 when they mentioned that the drug abuse program would eventually exhibit a "bottomed out" prevalence as noticed in Figure 7 (12). Recent data and historical trends of positive test results

(like those of the U.S. Air Force for the last two years -- Figure 8), almost confirm this prediction.

**FIGURE 8**

**TOTAL ACTIVE AIR FORCE POSITIVE URINE SPECIMEN RATES\***

**FISCAL YEAR 1995 & 1996**



\* Rates include data from all tests, except Aircraft Mishaps

\*\* % Positive equals number of members positive/total number of tests x 100

Source: Brooks AFB, TX - Drug Prevention and Demand Reduction Office 1997

The assessment or "prediction" by Bray, et. al. though, may still be several years premature. As depicted in Figure 7, the Air Force has consistently shown lower rates of drug use than its sister services (11, 14, 15). The quarterly positive specimen rates for the Air Force currently average around 0.52%. This is much less than the estimate of 1% prevalence reported in the 1995 DoD survey. The Air Force data may not be totally valid because its urine testing program has remained behind (in terms of testing percentages) those accomplished in the Army and Navy (Marines included). Presently, the Air Force subjects 75% of its personnel to urine drug testing at any given time. The Army and Navy test their personnel at a rate of 200% and 250% respectively (McLemore, K., Demand Reduction Counselor, Brooks, AFB, TX., personal interviews, 20 February, and, 2 April 1997). Follow-up on the results that are generated after the Air Force increases its testing rate will be important. It may determine if or not drug use has actually "bottomed out". If a leveling off is observed for Air Force illicit drug use results, it may warrant that the other services reassess their testing rates to see if their higher amounts are necessary. A reassessment of these rates in turn may also lead to allocation, resource or policy change.

#### CURRENT DOD POLICY

During the mid 1980's, DoD policy for drug abusers still leaned towards rehabilitation (34). This produced some concern regarding the actual DOD position, which in most instances correlated with local state laws (21). Some questioned if the policy of rehabilitation was leading to any major deterrence or if it had any actual effectiveness in decreasing the

overall incidence of substance abuse among military personnel (3). Behavioral attitudes, experimentation, environmental stresses, occupational stresses, peer pressure, and just the lack of education or adjustment had been some of the various reasons or excuses for drug use and alcohol abuse in the military as well as the general population (6, 7, 30, 41). Recent research studies have rendered new attitudes for all illicit substances including marijuana.

The DoD now mandates a "zero tolerance" policy (10, 12, 13, 21, 40). The consensus is that drug or illicit substance abuse significantly detracts from readiness, duty performance, productivity, and physical and mental health (13, 31). History and experience consistently demonstrated that illicit drug use leads to uncontrollable dependence, financial problems, major accidents, and disruption of the family structure. It also leads to, or at least is associated with, physical abuse or violence, conflicts in the workplace environment, numerous medical complications (injuries or disabilities and/or organ damage), and even death (6, 7, 12, 21, 31, 57).

Presently, DoD policy specifically states that DoD employees are required to refrain from using illegal drugs whether on or off duty. Because the DoD's mission is to protect and defend the United States, DoD employees must be free from the influence of drugs and be able to work in a drug-free environment. Public confidence in the Department of Defense is essential to the DoD mission and that the Department of Defense must not be compromised by drugs in the workplace (24). Military drug testing is specifically used to deter service members from illicit drug use. This includes all candidates on initial entry on active duty after

enlistment or appointment. (25). Policy permits commanders who detect drug abuse to assess the security, military fitness, readiness, good order, and discipline of their commands. Thus, this policy serves as a basis to take action, adverse or otherwise (including referral for treatment), against a service member based on a positive test result. Disciplinary actions for confirmed illicit drug use now include actions of less-than-honorable discharge (25). Overall, the current DoD drug policy is based on the social consequences of drug use, on the social impact of drug-induced behavior, and on supporting medical and research data.

## CONCLUSIONS

Psychoactive and illicit substances have been available throughout recorded history and will probably remain. To try to eliminate them completely is unrealistic. The DoD seems to be well aware of the individual and social risks of drug use. Recent DoD policy has, no doubt, been associated with rapid declines in drug use among military personnel. The U.S. military now tracks illicit drug use trends more attentively than ever. The military services have committed themselves to meet the goals set by the *Healthy People 2000* for reducing illicit drug use (15, 55).

There are several elements involved in DoD policy that may explain the lower illicit drug use prevalence among military personnel:

1. Military service is voluntary. A sense of commitment to DoD rules and guidelines is now more common knowledge for those joining the service.



2. Urine drug screening is still being conducted. The urinalysis testing program continues to keep some drug users from applying for military service. Anyone found to have a positive urine is eliminated from service selection. New changes in the urine collection procedure virtually eliminate users from being missed when tested (12, 34).
3. Shifts in drug policy have occurred over time within the military, in part reflecting the changing social and scientific opinion. The present "No Tolerance Policy" is used to try to maintain a desired drug-free status. Although a "get rid of them once it happens" approach cannot be used to account for a lower prevalence effect alone, it adds deterrence due to feared consequences or discharge of caught individuals.
4. The effectiveness of health promotion, education and prevention programs seems much better within the military community. Educational programs are being incorporated into initial base inprocessing for young troops. Access to and the availability of drug education is greater than that of their civilian counterparts. Reduced drug use of military personnel may occur because these program activities influence behavior, personality, and risk assessment for the military population as a whole.

The reduced prevalence of illicit drug use in the military is due to a cumulative effect of multiple influences: a rising awareness of health impacts of substance abuse, a greater health consciousness of military personnel, improvements in drug screening, and a "No Tolerance" policy.

Still, the drug problem has not disappeared. The most recent National Survey results show that the military drug abuse rates have the potential for rising since an increase in drug use was reported in the young civilian population (37, 38, 48, 49, 50). Because many military recruits are drawn from high school graduating classes, these prevalence figures may be predictive of drug use among recent and future entering personnel if the extant selection procedure fails.

The entire military community is at risk of the consequences of some of its members using illicit drugs and abusing alcohol (6, 7, 21). A decreasing quality of life, lack of readiness, career ending, and morally degrading situation is usually the end result of one's association with substance abuse (6, 7, 21). Because of the negative implications that arise from illicit substance abuse, Armed Forces policy and efforts directed toward deterrence should continue.

## **RECOMMENDATIONS**

Steady and notable progress has been made by the military during the past 26 years in combating illicit drug use. However, the military must address the potential influence from increases in drug use that is now occurring on a national level. Since the military will probably remain an all voluntary organization, monitoring programs and policies that influence and shape the attitudes of potential civilian recruits must continue and increase. Several recommendations can be made that may offer a means to continue and ensure deterrence of illicit drug use in the military.

Community solution functions that will offer protection, regulation, enforcement, inspection, and problem control include the following:

1. Increase the testing frequency of a larger population of active duty personnel, if feasible.

This may enhance drug abuse deterrence. Although military entrance screening has become more stringent, it is still not 100 percent effective in discovering high-risk category recruits, experimenters and users of illicit substances. Applicants can still wait to apply for service when they know that they will not test positive. Thus, by increasing random testing of service members assures maintenance of deterrence.

2. Follow up on the proposed increase urine drug testing in the U.S. Air Force. Presently, this program subjects only 75% of its active duty personnel and 25% of its civilian workforce to urine testing 8 days out of each month (McLemore, N., 1997 interview). Use results of expanded testing measures to help determine resource allocation, policy strategy, program development for future deterrence.

3. Military recruits should be informed of what constitutes violations of drug policy and the consequences during education sessions. This will reiterate the DoD's "No Tolerance" message.

4. Develop detailed guidelines for discipline, dismissal, or other control measures for unit commanders. Inform unit commanders and their subordinates on a regular basis.

5. Ensure that a constant, consistent, and routine focus on drug control is being accomplished by base security and Special Investigations personnel.

Community Education and Information actions should focus on the following:

1. Give briefings on locations of the bases' resources and programs available for educational counseling on substance abuse. All new military recruits should be surveyed at their initial inprocessing time to assess behavioral risk factors (1). Questions on self-medication and general perceptions of drug use can be incorporated into any service's survey to get the baseline views and attitudes on substance use.
2. Encourage individuals to establish healthy habits, healthy lifestyle alternatives and practices through behavior modification which de-emphasize alcohol and drug use.
3. Provide seminars aimed at curtailing substance abuse to the dependents of military personnel as well as civilian DoD employees.
4. Use volunteer health workers for the distribution of drug and alcohol awareness brochures and information.

Administration and management should attempt to help motivate individuals and deter drug use by:

1. Improving and providing medical care services for referrals of those who need or desire treatment for drug and alcohol abuse.
2. Organizing and implementing specific training for medical, preventive medicine, and mental health professionals that focuses on treatment and policy fulfillment without violating individual rights.
3. Having commanders set good examples by encouraging leadership, exhibiting fairness in policy establishment and enforcement. The openness of commanders to try new ideas and go

against established paradigms may be essential or useful for expecting change or behavioral modification in subordinates.

4. Creating a medical and substance abuse office network that organizes consistent and routine communication of between base personnel services. The DoD "Demand Reduction Program" is one method of accomplishing this. It functions within the domain of the National Counterdrug Institute and 1996 National Drug Control Strategy. It coordinates local, county, and state community organizations with the military Federal Agencies to improve the Civilian Drug Testing Program. Some large corporations have adopted similar assistance, communication, and deterrent programs to combat civilian drug use (16).

Communication through Informatics, meetings, E-Mail updates, programs' progress reports, and future project proposals will create an invaluable reference network.

Prevention of illicit drug use by deterrence must continue. Encourage military personnel to actively use the support services that are provided by: stress management, social activities, family counseling, and substance abuse are necessary. Social diversions that avoid involuntary exposure to the negative influences of substance abuse should exist for the young adult military population. Medical and religious departments need to also provide applicable information and support when required.

The DoD's efforts to combat substance abuse are not limited to illicit drugs. Obviously, objectives toward fitness, job efficiency, and mission readiness also require policies and programs to reduce alcohol and cigarette use. Suggestions have been made that a more

stringent stance should be taken to restrain alcohol and cigarette use (12). This consideration may help redirect some resources that were limited in the past. Deglamorization, rather than total prohibition, (which has not been successful) with explicit goals and policies is the foreseeable challenge.

The following education, training, and outreach activities currently in use or in development that deter substance abuse should be aggressively instituted:

1. The Air Force's Stronger Health Through Abuse Reduction and Prevention (SHARP) project.
2. The Navy's (and Marines) Personal Responsibility and Values Education and Training (PREVENT) program.
3. The Army's basic doctrine of drug deterrence through joint Federal, state, and local interagency programs (DoD - LEA counterdrug activity).

Many activities of drug abuse programs look promising. Exchange of ideas and evaluations of these activities will be helpful for continuing the reduction of drug abuse. A more direct or exact means for monitoring the quality of drug abuse deterrence services should still be investigated. The DoD should continue to use survey results as a means of assessing such an important issue. It is recommended that at least one or two more DoD surveys be conducted before the year 2000. Current efforts are being made to improve the database from survey results, drug use incidents, standardization methods, and urine testing

approaches. This will allow the Armed Forces and civilian population to successfully coordinate future projects and programs under the 'Demand Reduction' and *National Strategy*.

Although 18 - 25 year olds are the most susceptible personnel, drug abuse has no age, gender, race, or socioeconomic boundaries. Therefore, the military service and social consensus should not exhibit confusing standards when it comes to implementing and enforcing policy for illicit drug use. For 26 years, the DoD has shown that its deterrence efforts and mandated policy were not made to create malicious fear, but to objectively educate, inform, and provide valuable guidance for the people who defend our nation.

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## VITA

Paul Albert Young was born in Colon, Republic of Panama, on June 13, 1961, the son of Eduardo Young and Ethlyn Gabay Young. He graduated from E. E. Smith Senior High School, Fayetteville, NC in 1979. He attended NC State University on an Air Force ROTC scholarship from 1979 to 1983, and graduated with a BS in Biology. He earned his Doctor of Medicine degree from The University of North Carolina at Chapel Hill in May 1987. Dr. Young did his residency training in General Surgery for two years at The University of Medicine and Dentistry of Newark, NJ. From 1989 through 1990 he worked as a Fellow-Resident in Thoracic and Cardiovascular Surgery at Beth Israel Medical Center, NJ. In September 1990 he attended the Aerospace Medicine Primary course at Brooks AFB, Texas and became a flight surgeon. Initially stationed at Shaw AFB, South Carolina he was Interim Chief of Aerospace Medicine during Operation Desert Shield/Storm. He remained there until November 1993 and during that time served one tour to Dhahran, Saudi Arabia, in support of Operation Southern Watch. From November 1993 through June 1996, Dr. Young was assigned as the flight surgeon for the USAF Weapons School at Nellis AFB, Nevada. There he served as the OIC and Chief of Flight Medicine. He entered the Residency in Aerospace Medicine in August 1996 and began the Masters in Public Health Program at the University of Texas Health Science Center at San Antonio. He is married to Mary Ellen Sligh-Young, RN from Longbranch, New Jersey. Dr. and Mrs. Young have two daughters, Alana Renee, and Jenna Elyse.

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